

GEORGE P. COLEMAN MEMORIAL BRIDGE  
Spanning the York River at U.S. Route 17  
Yorktown  
York County  
Virginia

HAER No. VA-57

HAER  
VA

100-YORK,  
19-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
National Park Service  
Northeast Region  
Philadelphia Support Office  
U.S. Custom House  
200 Chestnut Street  
Philadelphia, PA 19106

HISTORIC AMERICAN ENGINEERING RECORD

GEORGE P. COLEMAN MEMORIAL BRIDGE HAER NO. VA-57

HAER  
VA  
100-YORK,  
19-

Location: Spanning the York River on U.S. Route 17 between Yorktown and Gloucester Point, York and Gloucester counties, Virginia

USGS Yorktown Quadrangle, Universal Transverse Mercator  
Coordinates: 18.366360.4122700

Date of Construction: 1950-1952

Engineer: Parsons, Brinkerhoff, Hall & Macdonald, New York City, New York

Fabricator: American Bridge Division of U.S. Steel Corporation Subsidiaries (formerly Virginia Bridge & Iron Company), Roanoke, Virginia

Contractor: Massman Construction Company and Kansas City Bridge Company, Kansas City, Missouri

Present Owner: Virginia Department of Transportation, Richmond, Virginia

Present Use: Vehicular bridge

Significance: The George P. Coleman Memorial Bridge is a 3,750-foot, steel deck-truss structure comprised of plate girder approach spans, a series of cantilevered fixed spans, and two center-pivot swing spans which operate in tandem. Built in 1950-1952, the bridge was a key element in a larger program of post-World War II transportation improvements throughout the lower Tidewater region. Designed by the prominent New York City engineering firm of Parsons, Brinkerhoff, Hall & Macdonald, the George P. Coleman Memorial Bridge is a significant example of hollow-pier construction utilizing the open-dredge caisson method, and among the few bridges with double swing spans still in operation today.

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 2)

Project Information:

This documentation was prepared during 1991-1993 for the Virginia Department of Transportation pursuant to a Memorandum of Agreement between the Federal Highway Administration, Virginia State Historic Preservation Officer, and Advisory Council on Historic Preservation, prior to removal of the superstructure and widening the bridge to four lanes.

Virginia Commonwealth University  
Archaeological Research Center  
Richmond, Virginia

The Cultural Resource Group  
Louis Berger & Associates, Inc.  
Richmond, Virginia

## I. INTRODUCTION

The George P. Coleman Memorial Bridge was erected in 1950-1952 to carry U.S. Route 17 over the York River between Yorktown and Gloucester Point. Its construction was among a number of large-scale measures, initiated by the Commonwealth of Virginia through passage of a revenue bond act in 1940, to improve transportation in the lower Tidewater region. Also included in this program were acquisition of the privately built and operated James River bridge and ferry systems operating in Hampton Roads area, creation of the Elizabeth River Tunnel Commission (to build a bridge-tunnel between Norfolk and Portsmouth), and construction of a tunnel-causeway across Hampton Roads. Designs for the "York River Bridge at Yorktown" (by which the project was generally known until the completed structure was dedicated on May 7, 1952) were developed by Parsons, Brinkerhoff, Hall & Macdonald of New York, both then and today one of the foremost engineering firms in the U.S. (The present name of the firm is Parsons, Brinkerhoff, Quade & Douglas.) The moderate height and tandem swing-span design of the Coleman Bridge resulted from a long-sought compromise between the United States Navy's desire for unobstructed navigation on the York River and the National Park Service's concern about visual impacts to the nearby Revolutionary War battlefields at Yorktown. Also of importance in the design were the generally poor bearing characteristics of the soils beneath the York River, which were addressed through use of hollow construction for the bases of all the river piers, as well as for the shafts of the two pivot piers, in order to reduce the weight of the structure to the greatest extent possible.

## II. DESCRIPTION

The George P. Coleman Memorial Bridge is 3,750 feet long between abutments, rising to 120 feet maximum elevation with a maximum vertical clearance of 60 feet. The bridge extends northwesterly from the western edge of the village of Yorktown, over the York River, to touch down beside the facilities of the Virginia Institute of Marine Science at Gloucester Point. The land approaches consist of eight 90-foot plate girder spans at the north (Gloucester Point) end, and two 65-foot and four 90-foot plate girder spans on the south (Yorktown) end. Between the approaches are 2,740 feet of symmetrically arranged riveted deck-truss construction. At the center is a pair of 500-foot center-pivot swing spans, set on piers 500 feet apart (center to center) to provide a clear navigation opening of 450 feet. Shoreward from each swing span is a 350-foot anchor span. From each anchor span, a 138-foot cantilever section projects toward the channel, while a 70-foot cantilever section projecting in the other direction carries a 210-foot "suspended" section supported at its landward end by a shore pier. The bridge carries a 26-foot, two-lane vehicular roadway flanked by 30-inch sidewalks.

The ends of the bridge are supported on straight wing abutments of reinforced concrete resting on cast-in-place concrete piles. The land piers (numbered 4S-9S on the south end, 4N-11N on the north end) rest on timber piles, which on the Gloucester Point side were driven through earth

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 4)

fill extended about 700 feet into the river. Piers 5S-9S and 5N-11N, of reinforced concrete, are rectilinear, slab-like structures with chamfered corners, rising with slight batter of the north and south faces to a maximum of about 50 feet above their bases, with dimensions of 4 feet by 15 feet at the top. The plate girders of the approach spans carried by these piers are set 22 feet apart (center to center), with the sidewalks carried on cantilever brackets outside the girders. The ends of each pair of girders are attached to an end floorbeam of equivalent (6 feet, 8 inches) depth, which in turn is carried on shoes set 11 feet apart (center to center). This type of construction, commonly utilized in Virginia at the time, made possible the use of piers narrower than would have been the case had the main girders been carried on the shoes (*Engineering News-Record* 1952:53).

Piers 4S and 4N are similar in construction to the other land piers. However, they are considerably wider (35 feet) and shorter (approximately 35 to 38 feet above the base), owing to the fact that each supports both the river end of the last girder span and the shoreward end of the "suspended" span. At these piers, the main girders and end floorbeam of the last approach spans are carried on a bar-latticed sway frame inserted between the vertical end posts of the "suspended span," which in turn are carried on fixed shoes set 28 feet, 10 inches apart (center to center), which corresponds to the center-to-center spacing of all the truss spans.

The Coleman Bridge's six river piers (1S-3S, 1N-3N) stand in water ranging from 50 to 80 feet deep. These piers are supported primarily on a medium to stiff clay contained within sand or silt strata lying below the mud bottom of the York River, which varies in thickness from 10 to 40 feet. Due to the poor bearing characteristics of this medium, the bridge designers fixed the maximum allowable bearing value at 3.5 tons per square foot in excess of that provided by the existing overburden. To accommodate this unusually low bearing value, the bases of these piers, as well as the pier shafts, are hollow. Each pier base, erected by the open-dredge caisson method, is basically a reinforced concrete box, with exterior walls (4 feet thick) braced by interior partitions three feet thick. The bases of the fixed-span piers (2S, 3S, 2N, and 3N) measure approximately 42 feet by 66 feet, while those of the two pivot piers (1N and 1S) have dimensions of 52 feet by 66 feet. The fixed-span piers themselves measure about 37 feet by 6.5 feet at the top; Piers 3S and 3N rise about 70 feet above their bases, while Piers 2S and 2N rise some 10 feet higher.

Each of the two pivot pier shafts is 44 feet in diameter and about 100 feet high above the base. Exterior walls of these pier shafts are three feet thick, braced by perpendicular interior walls of the same thickness and capped by a 5-foot-thick top slab which also aides in the distribution of load from the pivot. A reinforced concrete floor is situated about 44 feet below the level of the pier cap, and thus about 55 feet above the top of the pier base. This floor is accessible by means of a steel ladder and staircase. The interior walls of the pier shaft create four pie-shaped spaces, in which the marks of timber formwork utilized during construction are clearly evident. In the shaft of Pier 1S, one of these "rooms" contains a transformer which steps down the 2,400 volts supplied by Virginia Electric Power Company through submarine cable to 480 volts. Oil

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 5)

circuit breakers are located in the room containing the staircase, while submarine cable transformer switches are situated in the third "room." The remaining space is inaccessible.

The trusses of the Coleman Bridge are of the Warren type with verticals placed 28 feet, 10 inches apart on center. Each truss panel is 35 feet long, except at the 105-foot cantilever sections, where the last, riverward, panel is 33 feet, 9 inches long (to accommodate a 2.5-foot separation between it and the adjacent swing span). Truss depth varies from 27 feet (at U4) to 46 feet (at U18 and U29-U31). The floor system consists of riveted I-beam floorbeams and stringers. This system carries a concrete road surface across all the fixed spans, with steel mesh grating used on the swing spans to reduce load and provide greater ease of movement. The ends of the fixed trusses are carried on cast-steel rocker-type fixed and expansion shoes mounted on the tops of the piers.

Each of the swing spans is 500 feet long, weighing about 920 tons. Each moves clockwise, by means of an electrically operated rack-and-pinion system, on a bearing consisting of two stacked discs, one of steel, the other of bronze. Each span is carried on its pivot by means of a deep girder placed transversely between the bottom cords and corresponding vertical. When the span is open, four pairs of cast-steel balance wheels, set on a 34.5-foot-diameter track that is integral with the rack, provide lateral stability. When the span is closed, the center pivot carries the dead load, while the live load is transferred by means of a pair of steel wedges moved between the span and the top of the pier. When the spans are closed, live loads at the ends of the spans are supported by bascule-type shear locks. Each lock consists of a pair of I-shaped cast-steel bars, 18 inches deep, 10 inches wide, and 18 feet long, which move horizontally (rather like a deadbolt) in and out of bearing slots in the vertical end posts of the adjacent span. Each span is operated by means of three motor drive units arranged on steel mesh platforms to either side of the center pivot. Each unit consists of a 20-horsepower electric motor equipped with an overspeed device, a hydraulically operated thruster-type braking assembly, and a reduction gear assembly. Each of these platforms also carries a resistor cabinet and the separate electric motors used to operate the wedges.

A bridge house, set on steel supports about 18 feet above the roadway at the south pivot pier (1S), is the center of operations. The bridge house, accessed by steel stairs installed outside each of the trusses, is a one-room structure sheathed with aluminum panels, with bands of metal windows providing clear views to the north, south, and east, and a partial view to the west. The east end of the bridge house is occupied by cabinets containing circuit breaker relays. The west end contains a desk and the operator's console. Auxiliary power is available through a diesel motor-generator set housed within an aluminum-clad emergency generator room positioned directly beneath the roadway.

Opening and closing the bridge is a carefully choreographed operation. The primary "users" of the bridge are ships of the United States Navy, on their way to and from the Naval Weapons

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 6)

Station immediately upriver on the Yorktown side. Generally speaking, the Navy provides at least three hours' notice and, when possible, avoids commuter rush hours.

The first step in the bridge-opening process is the activation of the main line power circuit. Traffic signals placed beside the road, at appropriate distances beyond each of the approaches, are then turned on. As traffic halts, small wooden bar gates are lowered. As a final, and effective, deterrent to further traffic movement, large steel barriers, normally suspended from a frame above the roadway above Piers 2S and 2N, are lowered. Once the operator is assured that there is no traffic on the bridge, the shear lock joining the two swing spans at the center of the bridge is opened. Next to be undone are the wedges on the pivot piers, followed by the south rear lock and then the north rear lock.

The movement of the south swing span is initiated first. When this span has rotated 15 degrees, the north span is activated. The movement of the two spans is surprisingly swift, and almost without noise. When the south span has rotated 60 degrees, power is reduced to let the span "drift" to about 75 degrees. When it stops, power is applied to achieve the full 90-degree opening. The same pattern is followed by the north span. When both spans are at full open position, a green light is activated, indicating to the ship that it may proceed through.

When the ship has safely passed (and no others are waiting their turn), it will so signal by a blast on its horn. Closure of the bridge then begins, again with the south span first. When the two spans are once more aligned, they are secured in reverse order of opening: north rear lock, south rear lock, north wedges, south wedges, center lock. The steel barriers are then raised, followed by the "offgoing" traffic gates and then the "oncoming" traffic gates.

The Coleman Bridge has experienced very few alterations since its completion in 1952. Modern "cobra"-type light fixtures have replaced the original suspended luminaires, although the original steel posts and arms remain in place. The toll plaza and associated administration building, originally located just past the approach on the Gloucester Point side, are no longer present, having been removed once tolls were lifted in 1976. The bridge remains in very good condition, particularly in regard to operational features.

### III. HISTORICAL BACKGROUND

The York River is formed some forty miles from the Chesapeake Bay by the confluence at West Point of two smaller tributaries, the Mattaponi and the Pamunkey. It is one of four large tidal rivers that drain into the Chesapeake Bay and break the landmass of eastern Virginia into a collection of long peninsulas. These rivers provided a natural transportation network, and the lands along their banks were the first to be exploited by early Virginia colonists.

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 7)

Yorktown and Gloucester Point are situated on opposite sides of the York River about eight miles above the river's mouth. Both communities originated as the sites of government tobacco warehouses. The earliest warehouse was established at Gloucester Point (originally Tindall's Point) in 1632, by order of the Executive Council of the Virginia Assembly (Hatch 1940:266). Further development, however, awaited passage of the 1680 Act for Cohabitation and Encouragement of Trade and Manufacturing, which identified the Point as one of twenty ports of entry at which settlement was to be encouraged. By 1682, fifty acres had been surveyed into half-acre lots for the new community of Gloucestertown. Under the provisions of the Virginia Act of Ports, passed in 1691, a second government warehouse was established on the opposite side of the York River. Fifty acres there were laid out for the community of Yorktown, which was designated York County seat in 1698.

Both Gloucestertown and Yorktown were well established by 1710. Tobacco from York and Gloucester plantations was inspected, graded, and weighed at the government warehouses. From these ports, the crop was shipped to Britain, and to these ports the ships returned laden with manufactured goods for the colonists. Of the two communities, Yorktown (perhaps due to the presence not only of a customs house but also a county courthouse and a church) enjoyed the greater prosperity, with fine merchants' and planters' residences erected on high ground along Main Street, and wharves, warehouses, stores, and ordinaries, or taverns, crowding the shoreline near the landings (Harris and Harris 1980:3). By 1760, the town had a population of about 1,800, with approximately 250 buildings. Smaller Gloucestertown contained about 50 buildings, including the tobacco warehouse, several town houses belonging to wealthy planters, and a number of small commercial establishments. Events and developments beginning about 1760, however, initiated the gradual decline of both Yorktown and Gloucestertown. The Seven Years' War disrupted international trade, to the detriment of shipping both into and out of the ports. By the time shipping resumed, tobacco production had begun to move further west along the upper James River, in search of more fertile soils. As a result, the economic spheres of both communities gradually constricted to a more narrowly local basis.

The area was rescued from seemingly inevitable obscurity by important events of the American Revolution. In July and August 1781, British troops under Lord Cornwallis occupied both Gloucester Point and Yorktown, selected for their strategic locations near Chesapeake Bay. On September 5, however, a water engagement off the Virginia Capes concluded with the repulsion of a British naval force out of New York, leaving the French fleet in control of the entrance to the Chesapeake. The French, under Admirals de Grasse and de Barras, then attacked the ships which had brought Cornwallis to Yorktown, inflicting heavy losses. During these events, American forces under George Washington, having left New York for Williamsburg, marched to Yorktown. Beginning on September 30, the British endured a six-week siege from both land and sea, finally surrendering on October 19. Immediately thereafter, Washington's troops leveled most of the extensive network of earthen fortifications and siege works.



GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 8)

Yorktown's fortunes were not revived during the formative decades of the American republic. The British revisited the town in 1814, and bombardment and fire destroyed "many of the best buildings" (Martin 1836:298). By 1836, Yorktown supported only about 40 buildings, "the most of which [were] going fast to decay" (Martin 1836:298). During the Civil War, both Yorktown and Gloucester Point were occupied by Confederate forces, which rebuilt many of the Revolutionary War earthworks. In May of 1862, Gloucester Point was captured by Union troops, who then, under General George McClellan, threatened a second siege at Yorktown. The withdrawal of the Confederate forces toward Williamsburg culminated in the Battle of Seven Pines late that month, and the Seven Days' Battle in June. These two encounters ended McClellan's plans to take Richmond, and the Union army was withdrawn from the area by mid-summer.

After 1862, Yorktown slipped back into obscurity, reawakened every fifty years by celebrations commemorating Cornwallis' surrender and the winning of American Independence. In 1871, in preparation for the Yorktown Bicentennial, a Victory Monument was dedicated on a bluff east of town. No more notable events occurred until early in the twentieth century, when the federal government purchased 12,000 acres of land upriver from Yorktown for a naval supply depot. During World War I, the federal government built concrete roads between the depot and the towns of Williamsburg, Newport News, and Old Point Comfort. The York River served as the Navy's main anchorage on the Atlantic Coast during World War I, due to its deep water (81 feet, deepest on the Atlantic Coast) and sheltered position. During the 1920s, the site of Cornwallis' surrender and portions of the siege lines were acquired by the Yorktown Country Club, which catered to well-to-do sportsmen from Washington, Baltimore, Philadelphia, and New York. The club's golf course featured holes named for historic figures and events (Pocahontas, George Washington, Lafayette, Cornwallis' Surrender, The Spirit of '76, and McClellan). Rebuilt earthworks and commemorative tablets were located among the fairways and sand traps. Other facilities included clay and turf tennis courts, a "Mount Vernon" club house, outdoor squash and handball courts, clock-golf, archery, roque, riding, driving, hiking, canoeing, shooting, and a spacious indoor swimming pool filled with salt water pumped from the York River.

In 1930, inspired by the Williamsburg restoration project, Congress established Colonial National Monument (later Colonial National Historical Park) "to protect historical structures and remains and leave the area unimpaired for the enjoyment of future generations" (Riley to Superintendent, CNHP, 13 July 1947). The park comprised 10,200 acres, including 4,302 acres within Yorktown and the surrounding fields and woods, one acre on Gloucester Point, portions of the City of Williamsburg, and Jamestown Island. The Yorktown Sesquicentennial in 1931 and the rebuilding and hard-surfacing of U.S. Route 17 (the Tidewater Trail) between Fredericksburg and Gloucester Point further encouraged visitors to the Yorktown-Williamsburg area.

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 9)

The Yorktown and Gloucester Point communities themselves, however, did not prosper. The Gloucester Point side remained relatively rural and undeveloped, serving primarily as a landing for steamboats from the Baltimore & Ohio Company's Chesapeake Line (which operated a service from Baltimore to West Point) and a ferry. Buildings near the ferry landing included an oyster house, three stores, a hotel with an engine house, a garage, a barn and chicken yard, several frame dwellings, and a filling station (Gloucester County Deed Book 70:483). Although somewhat larger, Yorktown fared little better. A visitor to the town in the 1930s could look down from Main Street on the bluff to the buildings near the ferry landing and

see something of their harsh utilitarian outline, the corrugate iron buildings of the ice plant; the little docks and houses of the fish companies; the service stations with their swinging gaudy signs; the billboards; the wharfs; the "Boats for Hire" signs; the hot dog stands; quick lunch establishments; the lumber yard. . . at present [the town displays] the decadence of a small summer resort. . . a sleepy little town on a river with a bathing beach and small dance hall over the bath house. . . [it is] a ghost town uncolored by the brush of history, and without the pigment of the imagination, it is drab and uninteresting indeed [Crutchfield 1937:7].

At least part of the problem lay in the fact that until completion of the Coleman Bridge in 1952, persons wishing to cross the York River between Yorktown and Gloucester Point had recourse only to ferries. Ferries were operated from both sides of the river throughout the colonial period, heavily patronized by planters from then-populous Gloucester County having business at Yorktown or the capitals at Jamestown and later Williamsburg. As the fortunes of the area declined in the late eighteenth and the nineteenth centuries, so did the ferry service. In the late nineteenth and early twentieth centuries, it was reduced to a rowboat, which prospective patrons hailed by standing on the riverbank and waving a white flag (O'Hara 1981:20). With the burgeoning Naval presence and improving highways, however, ferry service expanded significantly by World War I. By that date, the Gloucester Point Ferry boasted several open lighters capable of carrying four or five cars, propelled by a motor boat secured alongside. The first enclosed, self-propelled ferry boat, the *Cornwallis*, was built for the operators, William T. Ashe and his wife, in 1918. It carried six to eight cars (CNHP, Clipping Files). Through the 1920s and early 1930s, Ashe's ferry grew to be quite a successful business, due to its location on the Tidewater Trail (U.S. Route 17), which in turn was part of the primary north-south coastal route between Washington, D.C., and the Hampton Roads area. The Tidewater Trail branched off U.S. Route 1 at Fredericksburg; went through Tappahannock, Saluda, and Gloucester Court House; crossed at the York River; and continued south to the James River Bridge and Portsmouth. By 1951, three diesel boats were in operation at the Yorktown-Gloucester Point crossing.

#### IV. EARLY ATTEMPTS TO BUILD A BRIDGE AT YORKTOWN

Following World War I, in response to the increasing popularity of the automobile and the economic opportunities available to any community that was tied to a network of roads, the Commonwealth of Virginia embarked on a series of large-scale highway improvements. Included in this campaign during the 1920s and 1930s was the rebuilding of 100 miles of the Tidewater Trail between Fredericksburg and Gloucester Point. However, due to the defeat of a 1923 proposed bond issue for road improvements, the Commonwealth could neither go into debt nor sell bonds to finance road construction projects (Steele 1951:15). This prevented the Department of Highways from undertaking any large-scale bridge-building programs. The State slowly replaced ferry service with low-level movable bridges on most of its major rivers in the 1920s and 1930s but could not afford to tackle the crossings that were unusually long or deep. This created an opening for private corporations interested in funding and building toll bridges to be operated at a profit.

Proposals for a crossing at Yorktown required approval from both the State Department of Highways and from the War Department. Due to the presence of the Naval Weapons Station just above Yorktown, any bridge spanning the river below the station was required to provide minimum horizontal and vertical clearance to assure safe passage of ships. By the late 1920s, the logical choice for a structure at this location was a high-level suspension bridge, which would easily meet War Department requirements.

The first proposal to span the York River at Yorktown was advanced in 1927 by a New York engineering firm and a group of professional promoters acting under the name of the Eastern Virginia Bridge Company (*Daily Press*, 19 December 1948). The company obtained permits from both the War Department and State Department of Highways for a high suspension toll bridge but was unable to raise the necessary funds for the project within the stipulated two years (Abbot to Regional Director, NPS, 5 August 1953:2). In 1928, a second company, Highway Bridge Incorporated, also secured the necessary clearances, for a 4,228-foot steel suspension bridge. This venture, too, failed due to lack of funding (Abbot to Regional Director, NPS, 5 August 1953:2).

By late 1932, there were again two bridge companies proposing a bridge at Yorktown. The first, the Independent Bridge Company, included the New York engineer who had designed the suspension bridge for the Eastern Virginia Bridge Company five years before (Abbot to Regional Director, NPS, 5 August 1953:4). The second, the York River Bridge Company, was a non-profit company formed by a group of Lower Peninsula businessmen who felt they could realize more profit from the economic growth that would come from having a bridge than from tolls charged. The president of the company was Raymond B. Bottom, publisher of the *Daily Press* of Newport News, who used his paper as a vehicle to promote construction of the bridge.

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 11)

That same year, the York River Bridge Company applied for, and received, a permit from the War Department. The company's proposed crossing was, as in the earlier proposals, a suspension bridge. It was to be supported by two 250-foot tall towers spaced 1,323 feet apart (Abbot to Regional Director, NPS, 5 August 1953). The steel, cross-braced towers would be located about 600 feet from each bank, so as not to interfere with the docking facilities of the Chesapeake Steamship Company. The bridge would provide 135 feet of vertical clearance for the 1,300-foot-wide channel. The estimated cost of the structure was \$1.75 million (*Daily Press*, 19 December 1948). The bridge promoters hoped to take advantage of financing offered by the Reconstruction Finance Corporation (RFC), arguing that building the bridge would provide relief employment to several hundred people in the area immediately and prove to be cheaper than a ferry in the long run (*Daily Press*, 19 December 1948).

Between the proposals of 1927 and 1932, however, Colonial National Historical Park had been established, and the York River Bridge Company's plans foundered on the rock of the Department of the Interior's disapproval. The Secretary of the Interior, fearful of the impact the bridge might have on the battlefield park, objected to the funding of any bridge in the Yorktown vicinity. It was the opinion of the National Park Service that a high-level bridge would dwarf the village of Yorktown and introduce an unfortunate anachronism within view of the Victory Monument and the battlefield sites. Due to the Secretary's influence, RFC financing was denied, and the project languished. While the National Park Service was convinced, given the amount of industrial growth in the Hampton Roads area, that a bridge would eventually have to be built at the crossing, the agency determined to block any bridge which met the Navy's vertical clearance requirements.

Once the York River Bridge Company failed to secure financing and its permit lapsed, the Independent Bridge Company requested and received a permit. The latter company's plans also depended on financing from the RFC, which the National Park Service successfully opposed once again. In 1933, the two companies, feeling they had a common goal, merged, but offered no new proposals in ensuing years.

As traffic in the area increased, more ferry boats were put into service and the *Daily Press* editorialized more often for a bridge. In 1935, the paper proposed that the York River bridge be included in Virginia's proposed new Public Works Administration program (CNHP, Clipping Files). By this time, the estimated cost of such a structure had increased to \$2 million. The *Daily Press* felt that a high-level bridge at the crossing would be acceptable to the National Park Service if the 250-foot towers and 60-foot-high anchor piers on the shores were clad with red brick and given a "colonial" treatment.

During this period, the State Department of Highways, which was still prohibited from charging tolls or going into debt, estimated that the cost of building a bridge at Yorktown would require all road funds appropriated for both the Fredericksburg and Suffolk Construction Districts. Such a diversion of funds was politically unacceptable, due to demands made on the Department of

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 12)

Highways for "make work" programs to help alleviate unemployment in the state. The Department did, however, advance a design concept for such a crossing, consisting of a 4,600-foot, high-level structure composed of seven through truss spans and 15 girder spans with 336 feet of clear navigation and 135 feet of vertical clearance.

By 1938, both transportation and political conditions were such that the Virginia General Assembly passed a resolution requesting that the York River bridge be built (*Daily Press*, 19 December 1948). The Department of Highways recommended that the governor seek legislation whereby the Commonwealth might finance the construction of a toll bridge at Yorktown (now estimated to cost \$3 million) by issuing certificates of indebtedness to secure the funds. Two years later the Revenue Bond Act of 1940 was passed, enabling the Department of Highways to undertake eight prioritized projects with financing provided by the sale of \$18 million worth of self-liquidating bonds. Also included in the bill were monies for the building or the acquisition of the James River Ferry from Claremont to Charles City; the Rappahannock River Bridge at Grey's Point; the James River Bridge at Hopewell; the Old Point Ferry at Norfolk; the James River Bridge at Jamestown; the Newport News Ferry at Norfolk; and the James River, Chuckatuck, and Nansemond River bridges in Warwick, Isle of Wight, and Nansemond counties (CNHP, Clipping Files).

The Department of Highways promptly developed new bridge plans, once again for a high-level suspension bridge with 120 feet of vertical clearance and 600 feet of horizontal clearance in the main channel (Allen to Chorley, 24 December 1946). The bridge would be supported by two 300-foot towers spaced 1,380 feet apart. The shore-mounted anchor piers were to be 125 feet tall and 150 feet square.

Earlier bridge proposals appear to have assumed that traffic on the Yorktown side could easily be accommodated on Route 17, which at the time wound its way north through the battlefields to the eastern side of Yorktown, then followed Main Street to the west edge of town where it dropped down the bluff to the ferry landing. By the early 1940s, however, traffic had significantly increased, and the Department of Highways initially decided to bring vehicles straight off the south end of the bridge and then through that portion of the battlefield park where Cornwallis had surrendered his army to Washington. Confronted with the National Park Service's refusal to provide the necessary right-of-way through the battlefields, however, the Department revised the plan so that the south approach would intersect with Main Street/Route 17 at a right angle.

The National Park Service mounted strenuous objections both to the proposed bridge, which the agency felt "would overshadow the park" (Allen to Chorley, 24 December 1946), and to the Department's proposal to route highway traffic through the village. The Park Service believed that the construction of the bridge would diminish the overall aesthetics of Colonial National Historical Park for future visitors, and, more specifically, result in damage to, or complete destruction of, a large number of sites and features associated with the Yorktown battlefield and

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 13)

the early history of the village itself, no matter how the south approach was connected to Route 17 (Riley to Superintendent, CNHP, 13 July 1947).

The Department of the Interior also fought the bridge project in Washington. Congressman Bland, representing the district in which Colonial National Historical Park was located, reintroduced legislation seeking, on behalf of the Department of Highways, right-of-way across the park for an approach road and abutment. An adverse report was submitted by the Department of the Interior and the effort failed. Congressman Bland was quoted as saying, "I told Ickes (then Secretary of the Interior) that the bridge would no more interfere with the Colonial atmosphere of the town than concrete roads and electric lights" (CNHP, Clipping Files).

Although the Department of Highways was granted a permit from the War Department to erect a high-level bridge in December 1941, the Department of the Interior remained firm in its refusal to permit access across the park. With the entry of the United States into World War II, all plans for the road improvement projects associated with the 1940 Revenue Bond Act were put on hold due to a combined shortage of money, men, and materials.

During the war, the National Park Service, with assistance from the Public Road Administration, devised several alternative locations for low-level, high-level, and pontoon bridges over the York River. With an eye toward shifting traffic from the ferry at Gloucester Point, all the proposed sites were upstream from Yorktown (Ickes to Truman, 11 June 1945). One of the Park Service's favored alternatives was at Ballards Creek just below the Naval Mine Depot. Another was near the mouth of Queens Creek, about ten miles upriver from Yorktown on a straight line running between Williamsburg and Gloucester Court House. Both of these plans called for low-level swing-span bridges. High-level bridges were considered for further upriver (out of site of the park) near West Point. The pontoon bridge was proposed for a location just below the Naval Weapons Station. With the help of the Bureau of Public Roads, the National Park Service computed mileage and travel times between the various towns in the area, charted population growth, and calculated the costs of the alternatives. None of these proposals, however, were taken seriously by local bridge proponents, businessmen in the Williamsburg and Hampton Roads areas who wished to be completely rid of the ferry, which was considered a major hindrance to economic growth.

In 1947, the Department of Highways resumed planning for the Yorktown bridge and approached the War Department for a permit to build. At this time, the Navy insisted on 135 feet of vertical clearance and 1,300 feet of horizontal clearance in the center of the channel (Ickes to Truman, 11 June 1945). Although the Navy was initially ready to extend its approval of the project, the Department of the Interior weighed in with a question about the wisdom of approving any vertical clearances which might limit the potential height of ships or their radar apparatus when technology was changing so rapidly that no one could guess what the future might require (Allen to Director, NPS, 12 March 1947). After due consideration, the Navy

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 14)

decided on a conservative position, eventually withdrawing its support for a high-level bridge altogether.

The Department of Highways then decided that a two-lane movable bridge at the crossing could be built more cheaply than any high-level suspension bridge (CNHP, Clipping Files). A year earlier, the *Daily Press* argued against movable bridges because they produced traffic delays and presented risk of mechanical breakdown (CNHP, Clipping Files). The paper also felt that the roadway should be wide enough to include a passing lane -- or even four lanes -- otherwise, "traffic jams are inevitable in the near future" (CNHP, Clipping Files). General James A. Anderson, the State Highway Commissioner at the time, announced that the Commonwealth would proceed with construction of a bridge across the York River "whether or not the Park Service wants to go along" (CNHP, Clipping Files).

The National Park Service continued to argue for various alternative locations throughout the fall. That winter, General Anderson informed the Park Service that, provided the agency canceled its request to have the Yorktown end of the bridge moved upstream to one of the alternative sites, the Virginia Department of Highways was ready to design and build a medium-level double swing-span bridge (Allen to Director, NPS, 7 February 1948). Anderson assured the Park Service that the approach from Route 17 through the Yorktown battlefield could be adjusted to the mutual satisfaction of both agencies. At this point, representatives of the National Park Service, concerned that the War Department, through the Army Corps of Engineers, was ready to approve plans for a high-level bridge at Yorktown, decided that a medium-level movable bridge was the best offer they could expect. Such a bridge might "overshadow" the Yorktown waterfront, but would be lower than the bluffs on which the village and battlefields were located.

Finally in 1948, after innumerable conferences, a medium-level, double swing-span, deck-truss structure was approved by all parties. A vertical lift bridge was ruled out for three reasons: the Navy required a practically unlimited vertical clearance; the Park Service would not approve the required towers; and the riverbed would not carry the required weight of the towers and necessary counterweights. Any differential settlement of either of the towers would cause a lift span to bind. A swing span was the most attractive alternative since it gave unlimited vertical clearance without high carrying towers, and the swings would not require counterweights.

The War Department issued its permit, and the Eightieth Congress passed an act directing the Secretary of the Interior to sell right-of-way across park property for the Yorktown approach. The estimated cost of the bridge was \$8 million (*Daily Press*, 19 December 1948).

In an effort to prevent parties opposed to the Revenue Bond Act of 1940, or the proposed construction it would finance, from stopping work on the bridge once the bonds were sold and the work begun, the State Department of Highways submitted the act before the State Supreme Court in late 1948 to prove its constitutionality (*Daily Press*, 19 December 1948). The

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 15)

following September, the Commonwealth issued \$19 million in revenue bonds to finance the various crossings projects (CNHP, Clipping Files). Of this amount, \$9.3 million would ultimately be required to complete the bridge over the York River at Yorktown.

## V. CONSTRUCTION OF THE GEORGE P. COLEMAN BRIDGE

[Note: Informative discussions on the engineering and construction of the George P. Coleman Memorial Bridge were published in *Engineering News-Record* (1950, 1952) and *Civil Engineering* (Quade and Vaccaro 1951). Unless otherwise indicated, information presented in this section is condensed from those articles and from the report of the Coleman Memorial Bridge Dedication Commission (Brown 1953).]

Designs for the Coleman Bridge were generated by the New York City firm of Parsons, Brinkerhoff, Hall & Macdonald. Contractors' bids for the project were opened in Richmond August 29, 1949, and contracts awarded the next month to the following:

Approach roads - W.H. Scott of Franklin, Virginia

Substructure - Massman Construction Company and Kansas City Bridge Company, both of Kansas City, Missouri

Superstructure - American Bridge Division of U.S. Steel Corporation Subsidiaries (formerly the Virginia Bridge and Iron Company) of Roanoke, Virginia

Toll plaza and administration buildings - Thorington Construction Company, Richmond

George Adgate was project manager for the joint contractors, Massman Construction Company and Kansas City Bridge Company, with John Kuhn, field superintendent, and Thomas Kinter, field engineer. For Parsons, Brinkerhoff, Hall & Macdonald, Maurice N. Quade was partner-in-charge. George Vaccaro designed the substructure and Roger Stevenson served as resident engineer. For the Virginia Department of Highways, C.S. Mullen was chief engineer and William R. Glidden was bridge engineer. Headquarters for the various contractors were set up near the shoreline in Yorktown, and test borings were made throughout the fall of 1949.

In December, the E.V. Williams Paving Company of Norfolk, subcontractors, began hauling earth fill to the marshland on Gloucester Point (*Daily Press*, 5 March 1950). Eight thousand pounds of dynamite were eventually placed in 39 holes in the marsh and then blown in an effort to consolidate the material under the marsh (*Richmond Times-Dispatch*, 10 August 1951). At the same time, the Gannaway Construction Company of Norfolk and the Magann Construction Company of Portsmouth, also subcontractors, began driving creosoted timber piles to a depth of 50 feet to support the land piers.



GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 16)

The Newport News Shipbuilding and Dry Dock Company subcontracted the construction of the six caissons in its submerged shipway No. 11. The caissons were fabricated of all-welded steel, with a 3/8-inch continuous skin plate reinforced with steel wales 3 feet apart on centers and by soldier beams and struts. Each caisson was divided into six compartments, each containing an open dredge well.

The first caisson left the shipyard in March 1950, towed by two tugs, taking thirty hours to make the 50-odd-mile trip to Yorktown. In order to give the caissons the required amount of stability and to prevent a sudden squall from "taking charge" on the trip from the James to the York River, 16 feet of concrete, weighing more than 1,500 tons, was poured into the exterior walls. When floated out of the graving dock in which they had been built, each drew 32 feet of water and projected 78 feet into the air. After March, one caisson a month was towed to the site until all had arrived, and the caissons were in various stages of sinking by October.

At the construction site, each caisson was maneuvered into a dock formed by four 112-foot-high guide towers prefabricated in Maryland of 14-inch steel pipe which were towed to the site and affixed to the river bottom with pipe piles. Each caisson was then slowly sunk through successive lifts of concrete forming the exterior and interior walls of the pier base. During this period, the dredge wells were capped and filled with compressed air to increase buoyancy. Once the cutting edge of a caisson had sunk about 10 feet below the river bottom, the compressed air was cut off and the dredge well caps removed, resulting in a further sinking (due to the weight of the caisson) of about three feet. Dredging commenced, utilizing clamshell cranes, until the caisson had reached a freeboard of about 10 feet. At this point, work was halted until the dredge wells could be extended and a temporary steel cofferdam erected on top of the caisson. Dredging resumed until the cutting edge of the caisson had reached final elevation. The bottom of the caisson was then sealed with a 14-foot thickness of tremie concrete poured through the dredge wells. The dredge wells were then filled with water, cut off, and capped, and the top of the caisson sealed with five feet of concrete. The forms for the hollow pier shafts were then built and the concrete poured. The forms and temporary cofferdam were subsequently removed.

Concrete for the ground piers was trucked in from Lee Hall, Virginia, by the Yorktown Ice and Storage Company. Concrete for the river piers, however, was mixed at a temporary plant erected by the W.G. Magann Corporation on the side of the bluff 100 yards from the shore on the Yorktown side. Aggregates and cement were trucked from a railhead about eight miles away and loaded into the bins, the tops of which were flush with top of the bluff. The concrete was batched into truck mixers which shuttled back and forth between the plant and a ramped dock built out over the river, where it was dumped into hoppers, loaded on barges, and towed out to the site. A floating crane removed each hopper from the barge, lowering it down a guide cage to a working platform. From there it was buggied down to another hopper at the point of deposit in the caisson walls and then down a flexible pipe, or "elephant trunk," and into place.

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 17)

To haul concrete and steel to the piers, the Massman Construction Company had four floating steam cranes, one diesel crane, ten steel barges, three diesel tugs, and one motor launch on site.

Progress on the project was slowed or halted at various times in early 1951 by freezing weather which prevented the pumping of concrete; an unexpected layer of hard clay 30 feet below the riverbed; and a walkout by the International Union of Operating Engineers which was composed of mechanics and crane and derrick operators (CNHP, Clipping Files).

The Virginia Bridge and Iron Company, then a division of U.S. Steel, subcontracted the fabrication of the superstructure. The flow of steel from the company's Roanoke plant was carefully scheduled. The parts were fabricated, trimmed, punched, painted, and test assembled before leaving the mill in order to ensure proper fitting at the permanent installation.

Due to the depth of the river toward mid-channel, false-work could not be used to erect the anchor and suspended spans. Installation of these spans was therefore accomplished by a floating-in operation using two railroad car floats, each 40 feet wide by 270 feet long and equipped with steel tower centering. The spans were erected on the centering using 50-ton floating derricks while the floats were anchored near the construction docks on the north shore. The 350-foot anchor spans were erected first, followed by the 140-foot cantilever arms, and then the "suspended" spans. Each fully assembled span was moved at high tide so it could be lowered onto the shoes as the tide fell.

By early summer of 1951, most of the steelwork had been completed on the girder approaches and the fixed truss spans, and work turned to the swing spans. They were erected one after the other in the open position on top of the two mid-river center piers using guy derricks. The guy derricks were placed on platforms at mid-truss depth after the steelwork over the 44-foot-diameter pivot pier (including the pivot girder and much of the rack and bearing wheel track) and two panels of trusses had been erected by floating derricks. To move forward as construction progressed, the guy derrick, which in actuality was equipped with stifflegs rather than guys, assembled a new platform in the panel ahead, then pulled itself along by attaching the boom-falls to the front beam of the platform, with the stifflegs sliding along the top cord. The major part of the steel erection was completed by the fall of 1951, and the winter months were spent installing the swing-span machinery and paving the decks of the approach girder and truss spans.

The initial closure, scheduled for April 16, was postponed for one day due to rain and high winds. Forty-one men were present the next day to test the operation of the spans. Under the direction of representatives of the Virginia Bridge and Iron Company, the north span closed without any problems just before noon. The south span was closed three hours later (CNHP, Clipping Files). The spans were locked down, and the assembled workers on either span came together and shook hands or "saluted one another with a prize fighters victory salute" (*Daily Press*, 18 April 1952). The toll facilities, last to be completed, were finished on May 6, one

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 18)

day before the bridge was officially opened. They were equipped with slender metal wands mounted in the center of each traffic lane just before the gates. These wands brushed against the bottoms of passing vehicles and grounded the vehicle so that the motorist would not be shocked by a potential charge of static electricity when handing money to the toll collector.

The bridge was dedicated on May 7, 1952. It was named the "George P. Coleman Memorial Bridge" in honor of a past, and then recently deceased, commissioner of highways. Coleman (1870-1948) was credited as the father of the Commonwealth's integrated highway system due to his early insistence on heavy-duty, all-weather roads capable of carrying an ever-increasing volume of traffic. Coleman was a native of Williamsburg and graduate of William and Mary College. He served as assistant highway commissioner between 1906 and 1913, and highway commissioner between 1913 and 1923. During his tenure as highway commissioner, he worked for the establishment of the present highway system in the General Assembly. He was later mayor of Williamsburg and served on the boards of various state and national highway associations.

The opening of the George P. Coleman Memorial Bridge eliminated what had been considered an obstacle to local travel, as well as to motorists on the main Atlantic Coast highway route between New England and Florida. The bridge, part of the state primary road system, carried approximately 2,500 vehicles a day (15,000 in the first week) during its first year of operation. Truck farmers from Tidewater Virginia and the Southside transporting their produce to northeastern urban markets between Washington and New York City formed a substantial portion of the traffic. Tourists traveling along the coastal route could more easily reach Jamestown, Williamsburg, and Yorktown via the bridge and the Colonial Parkway. By 1976, the year that tolls were removed from the span, traffic volume had increased to 10,000 vehicles a day. The bridge now forms a vital transportation link between Gloucester and York counties and also unites the outlying rural counties of King and Queen, Middlesex, and Mathews with the urbanized areas of James City County, Newport News, and Norfolk. The growth of Gloucester County as a bedroom community for the Williamsburg and Hampton Roads areas has also fostered increased commuter traffic. By 1976, the year that tolls were removed, 10,000 vehicles utilized the crossing. By 1983, the number had risen to an average of 21,000 vehicles per day. As a result in further increases over the past decade, the Virginia Department of Transportation will, during the 1990s, reconstruct the George P. Coleman Memorial Bridge with four lanes in order to meet traffic demands.

From the Dedication Day edition of the *Daily Press*, May 7, 1952 (CNHP, Clipping Files):

With help from God the brain of man  
Can do great things with skillful hand  
Today we praise as we conceive  
The wonders that these hands achieve  
Two more shores where boats did steer

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 19)

Now are joined by engineer  
Where once the ferries smoke did rise  
Steel girders stretch across the skies  
So you and I -- and all the rest  
Can partake of travel at its best!

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 20)

BIBLIOGRAPHY AND REFERENCES CITED

Abbot, Stanley W.

- 1953 Letter to Regional Director, Region One, National Park Service (NPS), August 5, 1953. On file at Colonial National Historical Park, Yorktown, Virginia.

Allen, Thomas J.

- 1946 Letter to Kenneth Chorley, 24 December 1946. On file at Colonial National Historical Park, Yorktown, Virginia.
- 1947 Letter to Director, National Park Service (NPS), 12 March 1947. On file at Colonial National Historical Park, Yorktown, Virginia.
- 1948 Letter to Director, National Park Service (NPS), 7 February 1948. On file at Colonial National Historical Park, Yorktown, Virginia.

Brown, Alexander C.

- 1953 *Yorktown Bridge*. Report of the Coleman Memorial Bridge Dedication Commission to the Governor. House Document No. 26. Commonwealth of Virginia Division of Purchase and Printing, Richmond, Virginia.

Colonial National Historical Park [CNHP]

Clipping Files. Maintained at Colonial National Historical Park, Yorktown, Virginia.

Commonwealth of Virginia Department of Highways and Transportation

- 1984 *George P. Coleman Bridge Alternate Study*. Commonwealth of Virginia Department of Highways and Transportation, Richmond, Virginia.

Crutchfield, Lee G., Jr.

- 1937 Notes on the Yorktown Tradition. *The Commonwealth*. vol. IV, no. 10.

*Daily Press* (Newport News, Virginia)

- 1947 "Sketch and Site of Low Level Span at Yorktown." 13 July 1947.
- 1948 "Bridge Proposed over River in 1932." 19 December 1948.
- 1949a "Erect Towers to Spot Points for New Bridge." 17 April 1949.
- 1949b "Construction begins on York Bridge at Gloucester Point." 11 December 1949.

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 21)

- 1950a "Bridge Workers Move Into River, Prepared to Set First Caissons." 5 March 1950.
- 1950b "Yorktown Bridge Caisson Nears Completion." 12 March 1950.
- 1950c "Approach Routes Designated from George P. Coleman Memorial Bridge." 14 May 1950.
- 1950d "Contractors Sign for New Bridge at Ferry Entrance." 5 June 1950.
- 1950e "State Reports Progress on New Yorktown Bridge." 16 July 1950.
- 1951a "Yorktown Bridge Huge Spans Under Fabrication at Plant." 18 January 1951.
- 1951b "Approach Road for Bridge Across York River." 7 May 1951.
- 1952a "New Yorktown Bridge Nears Completion." 11 March 1952.
- 1952b "May 7 Set for Dedication of George P. Coleman Bridge." 14 March 1952.
- 1952c "Costliest Bridge in Virginia to Open May 7 over York River." 13 April 1952.
- 1952d "All Out Dedication Set for Opening of Bridge." 13 April 1952.
- 1952e "2 Coleman Bridge Spans Closed in Trial, Linking York, Gloucester Areas." 18 April 1952.
- 1952f "Cruiser Macon Will Open York River Bridge to Ships." 1 May 1952.

*Engineering News-Record*

- 1950 Another Surrender at Yorktown. *Engineering News-Record* vol. 145, no. 25 (21 December 1950).
- 1952 Bridge Pulls Tidewater Virginia Together. *Engineering News-Record* vol. 148, no. 18 (8 May 1952).

General Assembly of the Commonwealth of Virginia

- 1990 *Report of the Virginia Department of Transportation in Response to House Resolution 92 on the Financial Alternatives for Funding the George P. Coleman Bridge to the Governor and the General Assembly of Virginia.* House Document No. 26. Commonwealth of Virginia Division of Purchase and Printing, Richmond, Virginia.

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 22)

Gloucester County Deed Books

On file at the Gloucester County Court House, Gloucester, Virginia.

Gloucester County Historical Committee

1970 *Six Periods in the History of Gloucester County.* Gloucester County Historical Committee, Gloucester, Virginia.

Hageman, James

1986 *The Heritage of Virginia.* The Donning Company, Norfolk/Virginia Beach, Virginia.

Harris, Elizabeth J., and William R. Harris

1980 *A Common Trust in Yorktown, Virginia.* Report for prepared for the Trustees of the Town of York by Historical Survey Associates, Inc.

Hatch, Charles E., Jr.

1940 *Gloucester Point in the Siege of Yorktown.* William and Mary Quarterly Second Series, vol. 20, no 2.

1973 *Historic Resource Study: "York Under the Hill" Yorktown Waterfront.* Report prepared for Colonial National Park. Denver Service Center, National Park Service, Denver, Colorado.

*Historic Yorktown*

n.d. Franklin Printing Company, Newport News, Virginia [no author given].

Hummel, Edward A.

1952 Letter to Lewis T. Jester, April 3, 1952. On file with National Park Service.

Ickes, Harold

1945 Letter to President Harry S. Truman, 11 June 1945. On file with National Park Service.

*Life Membership in the Yorktown Country Club at Yorktown, Virginia.*

n.d. [no author, no publisher given].

Martin, Joseph

1836 *A New and Comprehensive Gazetteer of Virginia and the District of Columbia.* Moseley and Thompkins, Printers, Charlottesville, Virginia.

McCartney, Mary

1980 History of Gloucester Point. Typescript.

GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 23)

O'Hara, Lucy Hudgins

1981 *Yorktown, As I Remember.* McClure Printing Company.

Plumer, Chris

1976 *The Steamboat's Coming! In Gloucester County, Virginia. . . A Bicentennial Perspective.* Gloucester '76 Celebration, Inc.

Quade, Maurice N., and George Vaccaro

1951 *Deep, Lightweight Piers for Bridge at Yorktown, VA, Built by Caisson Method. Civil Engineering*, February 1951, pp. 28-32.

*Richmond News Leader*

1948 "Proposed Yorktown Bridge." 7 April 1948.

*Richmond Times-Dispatch*

1946 "The Yorktown-Gloucester Point Bridge as the Highway Department Wants it." 25 April 1946.

1950a "Preparing Way for Yorktown Bridge." 24 March 1950.

1950b "York River Bridge Going Up." 27 July 1950.

1951a "Operation Earthquake' Blast Clears Marsh for New Road." 10 August 1951.

1951b "Last Span Goes In." 3 November 1951.

1952 "Yorktown Span Passes Initial Tests." 18 April 1952.

Riley, Edward M.

1942 *The History and Founding and Development of Yorktown, Virginia.* Photocopied typescript.

1947 Letter to Superintendent, Colonial National Historical Park (CNHP), 13 July 1947. On file with National Park Service.

Robins, Sally Nelson

1893 *History of Gloucester County, Virginia and Its Families.* West, Johnston & Company, Richmond, Virginia.



GEORGE P. COLEMAN MEMORIAL BRIDGE  
HAER NO. VA-57 (Page 24)

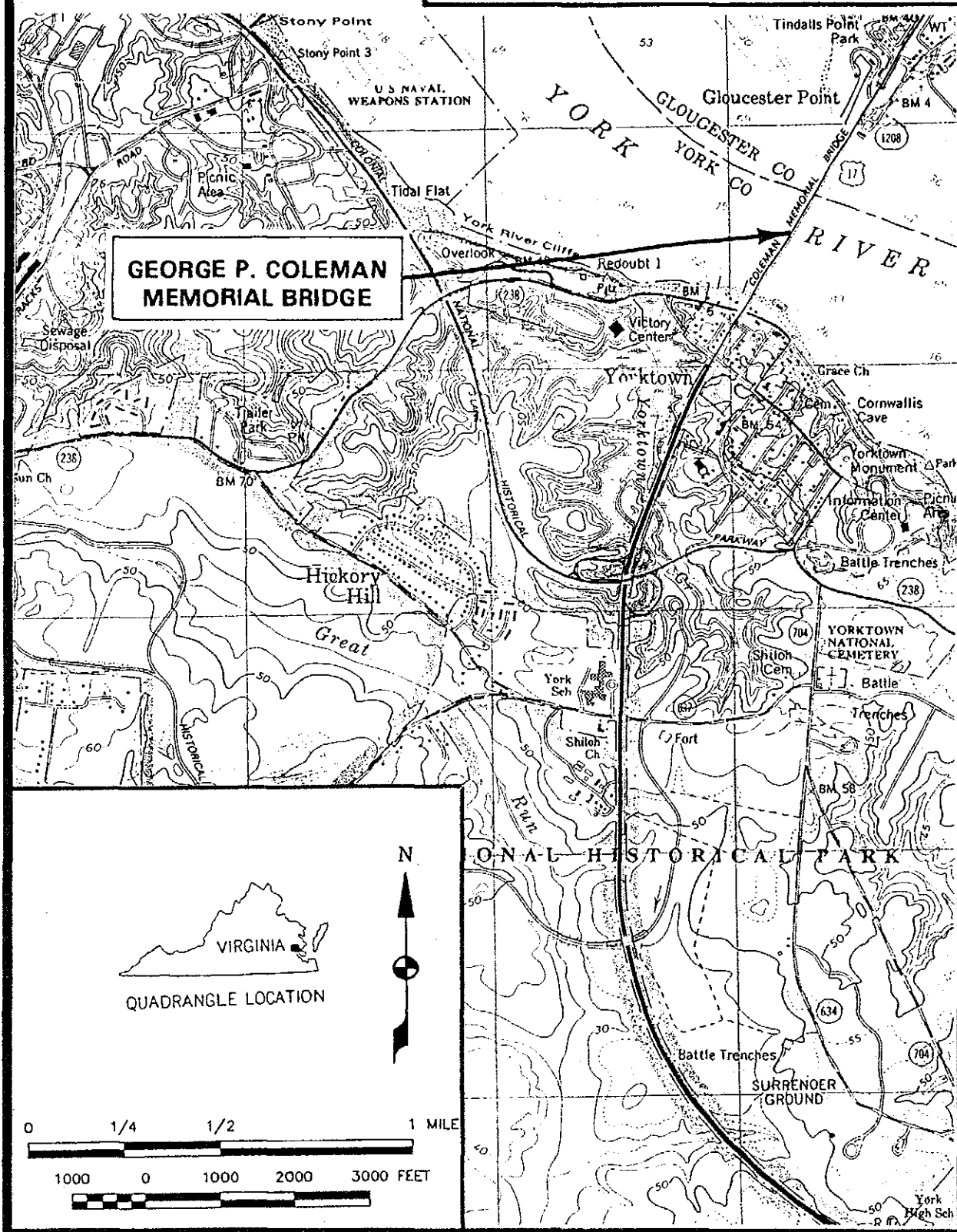
Steele, Robert E.

1951        Development of the State Highway System: 1906-1950. *Virginia and the Virginia Country* vol. V, no. 4 (April 1951).

Trudell, Clyde F.

1971        *Colonial Yorktown*. The Chatham Press, Old Greenwich, Connecticut.

**GEORGE P. COLEMAN MEMORIAL BRIDGE  
HABS NO. VA-57 (PAGE 25)**



**FIGURE 1: Location Map**

**SOURCE: USGS 7.5 Minute Series, Yorktown, Va. Quadrangle (photorevised 1984)**